

Two new species of the spider genus *Ochyrocera* (Araneae, Ochyroceratidae) from Mexico

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Abstract. Two new species of the spider genus *Ochyrocera* Simon 1891 are described from Mexico. *Ochyrocera juquila* new species was collected under moist rotten logs and hollow trunks on a thick bed of pine needles in oak-pine forests located in a mountain range south of the city of Oaxaca at 1400–2700 m elev. *Ochyrocera juquila* resembles *O. quinquevittata* Simon 1891 from the Island of St. Vincent, in the angular shape of the embolus, which in the new species is V-shaped and in *O. quinquevittata* is L-shaped. *Ochyrocera chiapas* new species, was collected under rotten trunks and hollow trunks in abundant leaf litter in the tropical, humid Lacandona rainforest region located in eastern Chiapas, near the border with Guatemala. The species occurs at 160–260 m elev. *Ochyrocera chiapas* resembles *O. arietina* Simon, 1891 from the island of St. Vincent, in the similar shape of the embolus and distal apophysis of the embium, but in *O. chiapas* the embolus is more strongly curved and directed toward the distal part of the tibiae forming a “D”; in *O. arietina* the embolus is not as strongly curved as in *O. chiapas*. In both species, males and females were collected near each other; the females carried their egg sacs with their chelicerae. A key to the four known Mexican species is provided.

Resumen. Dos nuevas especies del género de arañas *Ochyrocera* Simon 1891 son descritas para México. *Ochyrocera juquila* nueva especie, fue colectada bajo troncos podridos y troncos huecos en una capa gruesa de agujas de pino, en bosque de pino-encino, en un sistema montañoso al sur de la ciudad de Oaxaca entre 1400–2700 m elev. *Ochyrocera juquila* está relacionada con *Ochyrocera quinquevittata* Simon 1891 de la Isla de San Vicente, en la forma angular del émbolo, el cual en la nueva especie es en forma de “V”, y en *O. quinquevittata* en forma de “L”. *Ochyrocera chiapas* nueva especie, fue colectada en bosque tropical, bajo troncos podridos y en troncos huecos con mucha humedad, y abundante hojarasca, en la región de la selva Lacandona localizada al este de Chiapas, cerca de la frontera con Guatemala, localizada entre 160–260 m elev. *Ochyrocera chiapas* está relacionada con *Ochyrocera arietina* Simon, 1891 de la Isla de San Vicente, en la forma similar del émbolo y apófisis distal del cimbio, pero en *O. chiapas* el émbolo es más fuertemente recurvado y dirigido hacia parte distal de la tibia formando una “D”, en *O. arietina* el émbolo no está fuertemente recurvado como en *O. chiapas*. En ambas especies, machos y hembras fueron coleccionados cercanamente entre ellos; las hembras cargaban sus sacos de huevos con los queliceros. Se presenta una clave de identificación para las cuatro especies mexicanas.

Keywords: Haplogynae, taxonomy, Oaxaca, Chiapas

The spider family Ochyroceratidae Fage 1912 has 14 genera and 155 species (Platnick 2008). Edwards et al. (2003) reported four genera from the western hemisphere: *Fageicera* Dumitrescu & Georgescu 1992 and *Speocera* Berland 1914, recorded only from Cuba, *Ochyrocera* Simon 1891 in the Caribbean region and Brazil, and *Theotima* Simon 1893 restricted to the Caribbean region.

Ochyroceratids are lucifugous spiders which live in leaf litter and detritus in mesic habitats, and many occur in caves as troglolithes (Gertsch 1973, 1977; Brignoli 1973; Lopez & Lopez 1997; Hormiga et al. 2007). These spiders spin tiny tangled webs in wall crevices and under litter (Gertsch 1973). *Ochyrocera* species build small, rather flimsy sheet webs with silk lines extending above the sheet that appear to serve as structural lines overlaid with finer silk lines running parallel to each other. The sheet is probably made of silk from the linearly arranged brush of posterior lateral spinneret aciniform gland spigots (Hormiga et al. 2007). There is limited published information available on the life history of these spiders (Edwards et al. 2003; Hormiga et al. 2007); some species of the family are parthenogenetic (Edwards et al. 2003).

Simon (1893) included *Theotima* and *Ochyrocera* in the Leptonetidae, where they remained until Fage (1912) erected the family Ochyroceratidae (Paquin & Ubick 2005). The genus *Ochyrocera* has 22 species, mostly from the Neotropical region (Brignoli 1974, 1978; Hormiga et al. 2007; Platnick 2008). In

the New World, the genus is found in Florida, Central America, and parts of South America. Some species are distributed in the West Indies, like Puerto Rico, where two undescribed, sympatric species of *Ochyrocera* occur in forest leaf litter (Simon 1891; Edwards et al. 2003; Paquin & Ubick 2005; Platnick 2008). Recently Hormiga et al. (2007) described *Ochyrocera cachote* from Hispaniola. Two species have been recorded from Mexico: *Ochyrocera fagei* Brignoli 1974 from Teopisca, Chiapas and *O. simoni* O. Pickard-Cambridge 1894 from Teapa, Tabasco. The objective of this contribution is to describe two new species recently collected in Mexico. *Ochyrocera juquila* new species and *O. chiapas* new species are the third and fourth species of the genus *Ochyrocera* from Mexico.

METHODS

The specimens, preserved in 80% ethanol, were examined with a Nikon SMZ645 stereoscope. A Nikon Coolpix S10 VR camera was used to photograph the dorsal view of the prosoma and opisthosoma of male and female specimens, and the internal genital area of females. The photographs were edited in Adobe Photoshop 7.0 to make the illustrations. The specimens were then processed in order that photomicrographs could be taken with an HITACHI S-2460N scanning electron microscope (SEM). All measurements of the descriptions are recorded in millimeters and SEM photomicrographs

are noted in microns. The map was done using Microsoft Encarta Encyclopedia and was edited in Adobe Photoshop 7.0. The specimens are deposited in the Colección Nacional de Arácnidos (CNAN) of the Instituto de Biología, Universidad Nacional Autónoma de México, México D. F. (IBUNAM) and the American Museum of Natural History (AMNH), New York, USA. Abbreviations used in the description are: ALE, anterior lateral eyes; ALS, anterior lateral spinnerets; AME, anterior median eyes; B, bulb of the palp; C, cymbium; DAC, distal apophysis of cymbium; E, embolus; PLE, posterior lateral eyes; PLS, posterior lateral spinnerets; PMS, posterior median spinnerets; S, spermathecae.

TAXONOMY

Family Ochyroceratidae Fage 1912

Genus *Ochyrocera* Simon 1891

Type species.—*Ochyrocera arietina* Simon 1891

Ochyrocera juquila new species

Figs. 1–10

Type material.—MEXICO: *Oaxaca*: 1 ♂ holotype (CNAN-T0314), 5 km from Juquila to Panixtlahuaca, Municipio Santa Catarina Juquila (16°15.071'N, 97°18.799'W, 1447 m), 27 June 2006 (A. Valdez, O. Francke, H. Montaña, G. Villegas, C. Santibañez, cols.). Paratypes: 1 ♀ with egg sac (CNAN-T0315), 4 ♀♀ (2 with egg sac), 1 ♂, 1 ♂ subadult (CNAN-T0319) and 1 ♀, 1 ♂ (AMNH), same data as holotype; 1 ♂ (CNAN-T0316), turn off to Magdalena Mixtepec, Municipio Magdalena Mixtepec (16°55.811'N, 96°52.455'W, 2676 m), 3 December 2005 (A. Valdez, O. Francke, H. Montaña, cols.); 4 ♀♀, 1 ♂ (CNAN-T0317), 3 km E of turn off to Santa Inés del Monte, Municipio Santa Inés del Monte (16°56.445'N, 96°51.631', 2665 m), 3 December 2005 (A. Valdez, O. Francke, H. Montaña, cols.); 1 ♀ (CNAN-T0318), 10 km S of San Jerónimo Coatlán, Municipio San Jerónimo Coatlán (16°12.917'N, 96°54.206'W, 2160 m), 25 June 2006 (A. Valdez, O. Francke, H. Montaña, G. Villegas, C. Santibañez, cols.); 9 ♀♀ (5 with egg sac), 1 ♂ (CNAN-T0320), 10 km SW of San Pablo Coatlán, Municipio San Pablo Coatlán (16°11.343'N, 96°48.687'W, 1855 m), 25 June 2006 (A. Valdez, O. Francke, H. Montaña, G. Villegas, C. Santibañez, cols.).

Etymology.—The specific name is a noun in apposition and refers to the municipality of the type locality: Santa Catarina Juquila, Oaxaca, Mexico.

Diagnosis.—Males can be distinguished by the embolus bent over 75° with a basal protuberance near the bulb, the globular bulb, and the cymbial apophysis with hook-shaped tip (Figs. 3, 4). Females can be distinguished by the oval genital area with two parts, the anterior one larger than the posterior part (Fig. 9).

Description.—Male (holotype): Specimen preserved in alcohol with carapace fuchsia, fovea indistinct (Fig. 1). Clypeus long, same color as carapace. Chelicerae pale yellow, fangs light orange with seven small teeth and one large tooth on a single line (Fig. 2). Six eyes in three groups, slightly elevated with black rings around them (Fig. 1). Sternum circular, wider than long; light violet with faint dark stripes. Labium longer than wide, not fused to the sternum. Endites pale yellow, longer than wide, convergent, with small violet

spots. Coxae fuchsia. Trochanters and patellae pale yellow. Legs fuchsia. Distal part of femora pale yellow. Patellae pale yellow. Proximal and distal parts of metatarsus and tarsus pale yellow. Metatarsus and tarsus with pseudosegmentation. Opisthosoma oval, dark gray (Fig. 1). Ventral plate of gonopore violet. ALS conical, PMS slender and longer than ALS, PLS cylindrical and stout. Spinnerets pale violet.

Palp: Tibia long and cylindrical (Figs. 3, 4), pale fuchsia; distal apophysis of cymbium hooked (Figs. 3, 4). Bulb globular, with a basal protuberance (Figs. 3, 4). Embolus long, V-shaped, with distal part curved and sclerotized (Figs. 3–6).

Measurements: Total length 1.23. Carapace 0.52 long, 0.47 wide. Clypeus length 0.09. Diameter of AME 0.04, ALE 0.05, PLE 0.06. Sternum 0.36 long, 0.34 wide. Leg lengths: I- femur 1.07/ patella 0.17/ tibia 1.25/ metatarsus 0.84/ tarsus 0.59/ total 3.92; II- 0.92/ 0.18/ 1.0/ 0.68/ 0.53/ 3.31; III- 0.71/ 0.16/ 0.81/ 0.60/ 0.45/ 2.73; IV- 0.98/ 0.18/ 1.16/ 0.75/ 0.59/ 3.66. Leg formula: 1-4-2-3.

Female (Paratype): Differs from male as follows: carapace violet. Clypeus high (Fig. 7), same color as carapace. Chelicerae fuchsia on frontal face and light yellow on prolateral face (Fig. 8). Fangs orange. Sternum circular, violet without stripes. Opisthosoma larger than in the male.

Genital area: Poorly chitinized, oval with two parts in ventral view, anterior part larger than posterior (Fig. 9). Spermathecae oval and separated, with visible long and thin prolongations toward posterior part of genital area (Fig. 10).

Measurements: Total length 1.26. Carapace 0.58 long, 0.49 wide. Clypeus length 0.08. Diameter of AME 0.04, ALE 0.04, PLE 0.05. Sternum 0.36 long, 0.34 wide. Leg lengths: I- femur 0.9/ patella 0.18/ tibia 1.04/ metatarsus 0.68/ tarsus 0.46/ total 3.26; II- 0.74/ 0.17/ 0.82/ 0.58/ 0.46/ 2.77; III- 0.65/ 0.16/ 0.69/ 0.52/ 0.42/ 2.44; IV- 0.88/ 0.13/ 0.97/ 0.66/ 0.51/ 3.15. Leg formula: 1-4-2-3.

Variation.—Total length: 1.2–1.4. Coloration: some specimens fuchsia, pale orange, or purple on the prosoma and the legs. The opisthosoma varies from light blue to dark gray.

Distribution.—Known only from the type localities (Fig. 20).

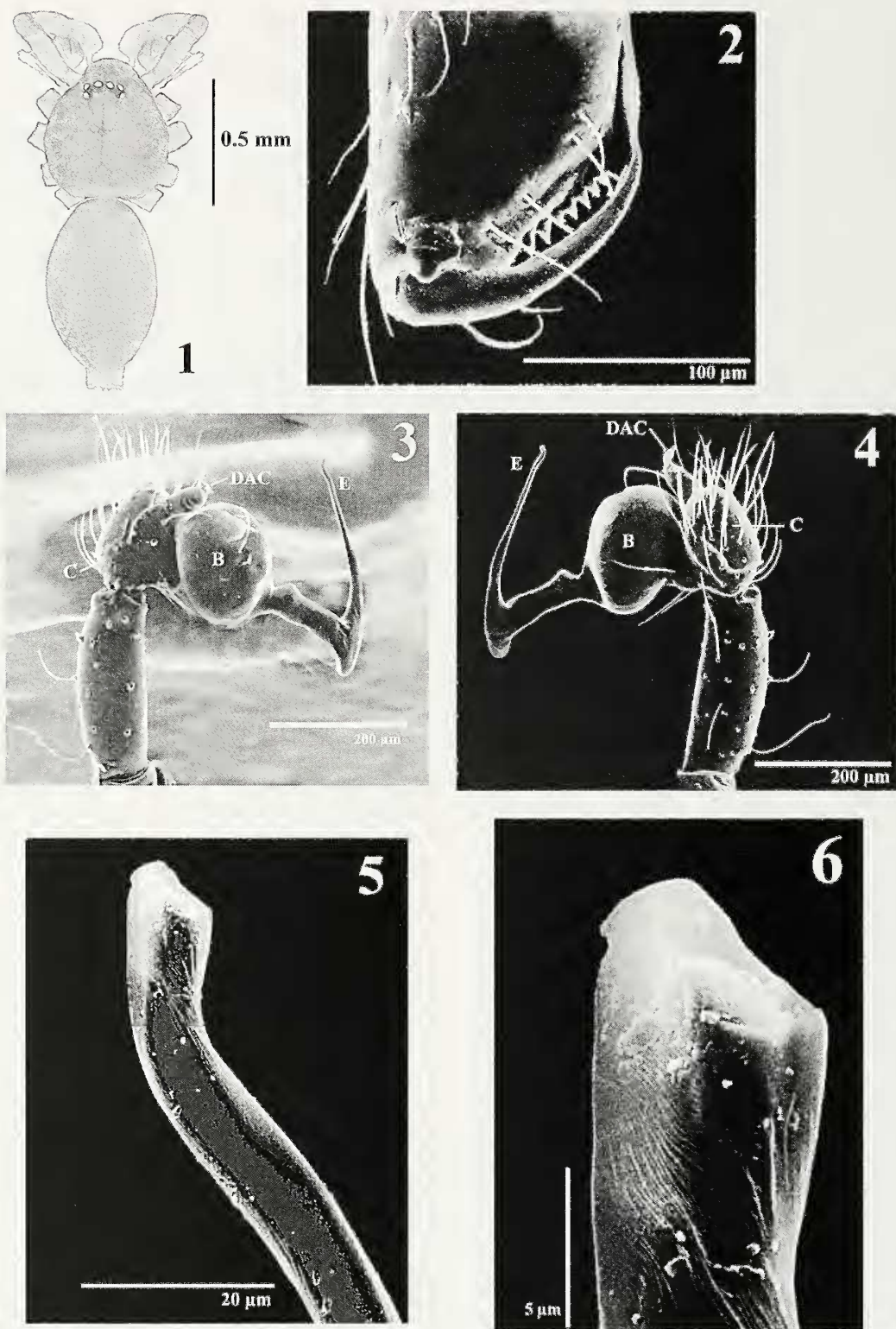
Related species.—*Ochyrocera juquila* resembles *O. quinquevittata* Simon 1891 from the Island of St. Vincent in the angular shape of the embolus, which in the new species is V-shaped (75°), and in *O. quinquevittata* is L-shaped. The distal apophysis of the cymbium of the palp with hook shape is curved and short in *O. juquila*, whereas in *O. quinquevittata* it is straight and long. Finally, the bulb in *O. juquila* is globular, whereas in *O. quinquevittata* it is oval.

Natural History.—The specimens of *Ochyrocera juquila* were collected under moist rotten logs and hollow trunks on a thick bed of pine needles in oak-pine forests located in a mountain range south of the city of Oaxaca at 1400–2700 m elev. Males and females were collected near each other, and the females carried their egg sacs with the chelicerae.

Ochyrocera chiapas new species

Figs. 11–19

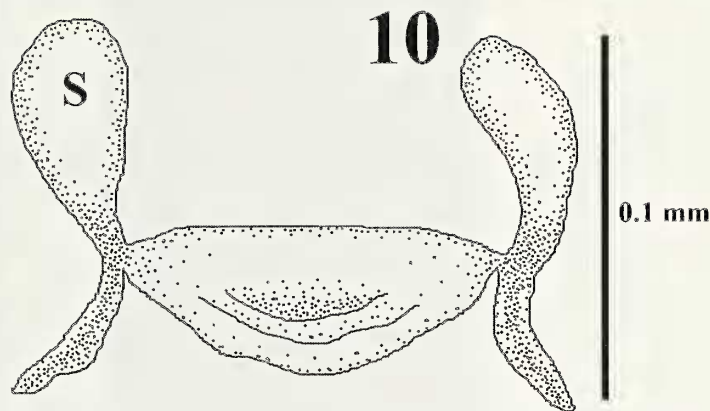
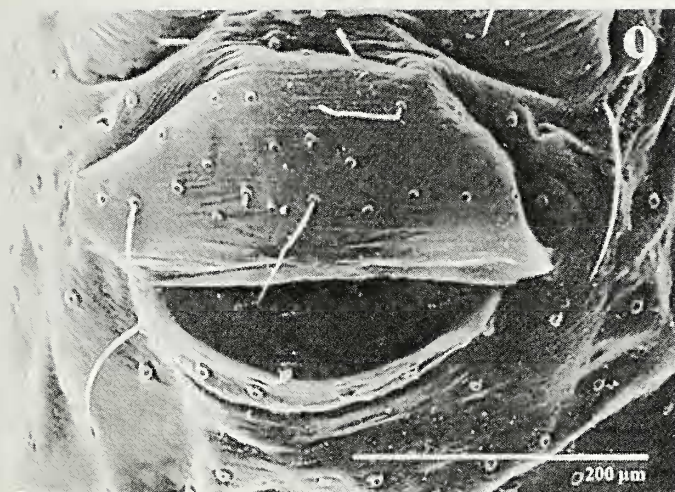
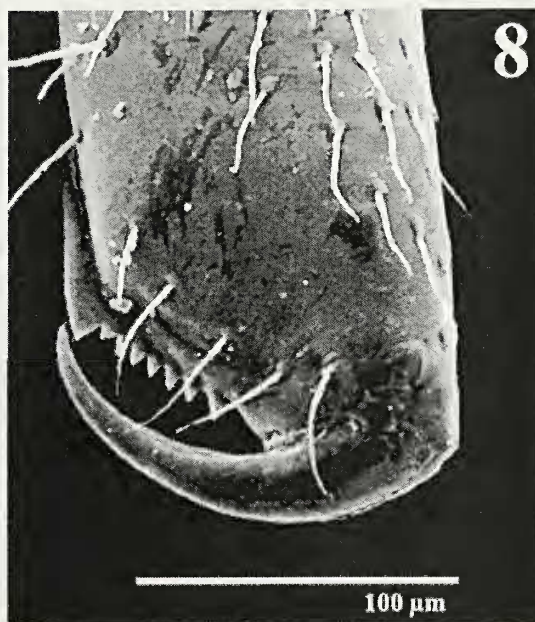
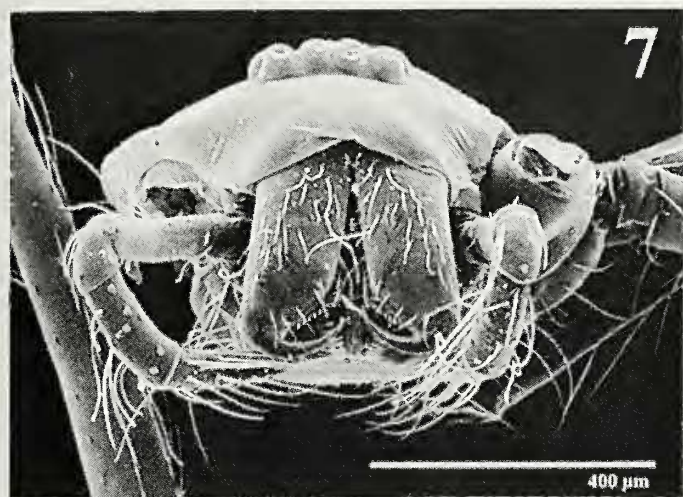
Type material.—MEXICO: *Chiapas*: 1 ♂ holotype (CNAN-T0321) from El Taller, Sierra de la Cojolita, Municipio Ocosingo (16°45.756'N, 91°01.933'W, 257 m), 9 August 2005



Figures 1–6.—*Ochyrocera juquila* new species, male: 1. Prosoma and opisthosoma, dorsal view; 2. Right chelicera, anterior view; 3. Left palp, prolateral view; 4. Left palp, retrolateral view; 5. Embolus; 6. Embolus, apical view.

(A. Valdez, G. Montiel, R. Paredes, E. Cabrera, A. Ávila, A. Ibarra, J. Castelo cols.). Paratypes: 1 ♀, 1 ♂ and 1 juvenile (CNAN-T0322), same data as holotype; 1 ♀, 1 juvenile (CNAN-T0323) from Reserva Comunal de la Cruz, km 150 marker on Crucero Corozal-Benemérito road, Municipio Ocosingo (16°42.878'N, 90°54.328'W, 167 m), 9 August

2006 (A. Valdez, H. Montañó, S. Rubio, N. Pérez, I. Mondragón, cols.); 1 ♀, and 3 juveniles (CNAN-T0327), same locality, 8 May 2006 (A. Valdez, H. Montañó, G. Montiel, R. Paredes, M. Guzmán, cols.); 4 ♀♀, 1 ♂ and 3 juveniles (CNAN-T0324) from Arroyo Nayte, Sierra de la Cojolita, Municipio Ocosingo (16°45.546' N, 91°02.629' W, 209 m), 18 October



Figures 7–10.—*Ochyrocera juquila* new species, female: 7. Carapace, anterior view; 8. Left chelicerae, anterior view; 9. Genital area, ventral view; 10. Genital area, dorsal view.

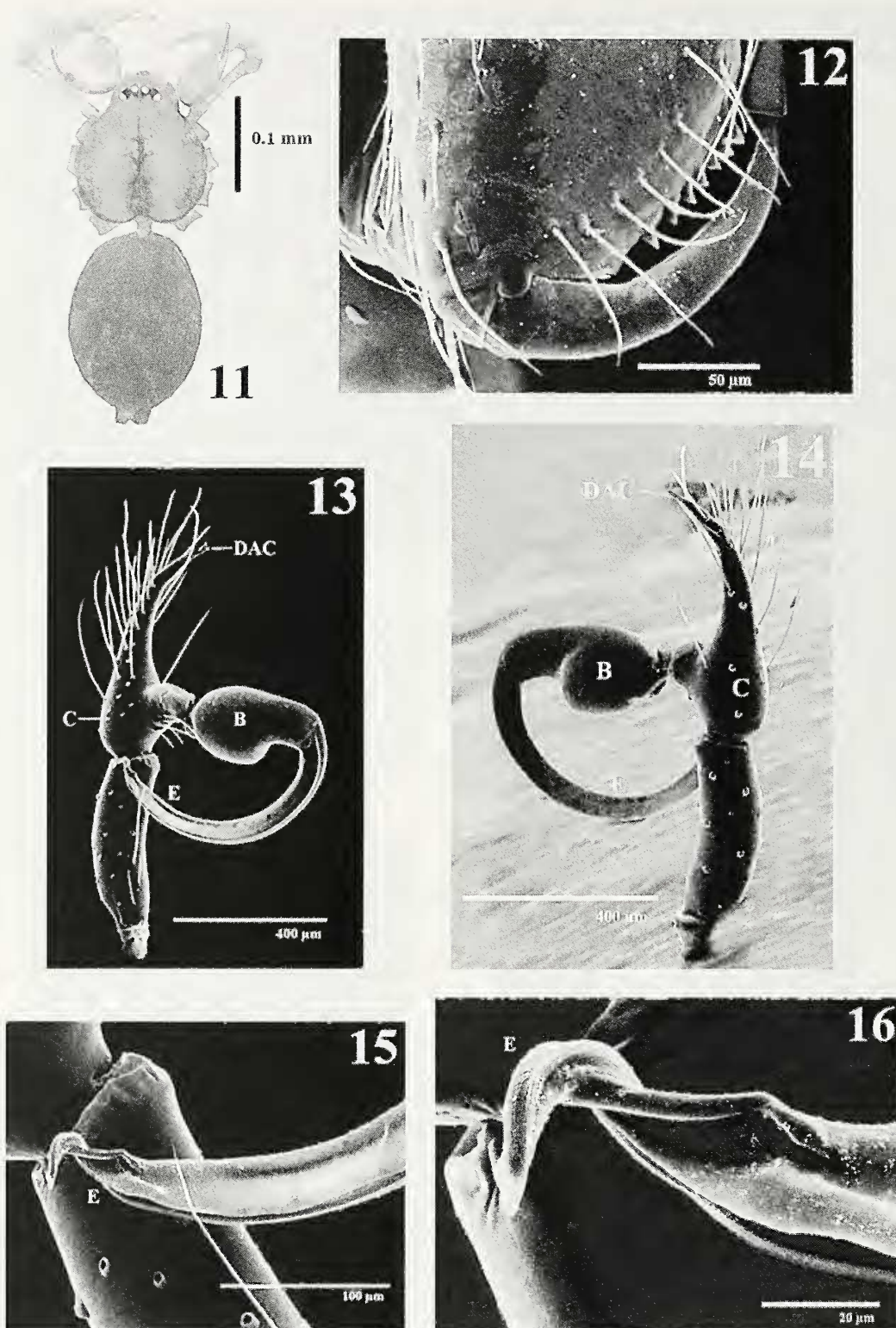
2006 (A. Valdez, O. Francke, H. Montaña, A. Ballesteros, cols.); 1 ♂ (CNAN-T0328), same locality, 9 August 2006 (A. Valdez, H. Montaña, S. Rubio, N. Pérez, I. Mondragón, cols.); 1 ♀ (CNAN-T0330), same locality, 3 October 2005 (H. Montaña, G. Montiel, I. Mondragón, cols.); 1 ♀ (CNAN-T0325) from El Aserradero, Municipio Ocosingo (16°47.119'N, 91°02.290'W, 205 m), 6 September 2005 (A. Valdez, O. Francke, H. Montaña, A. Jaimés, M. Córdoba, cols.); 1 ♂ (AMNH), same locality, 18 October 2006 (A. Valdez, O. Francke, H. Montaña, A. Ballesteros, cols.); 2 ♀♀, 4 juveniles (CNAN-T0326), same locality, 18 October 2006 (A. Valdez, O. Francke, H. Montaña, A. Ballesteros, cols.); 2 ♀♀, 2 ♂♂, 3 ♂♂ subadult (CNAN-T0329) from El Encaño, Sierra de la Cojolita, Municipio Ocosingo (16°48.677' N, 91°04.646' W, 165 m), 3 October 2005 (H. Montaña, G. Montiel, I. Mondragón, cols.); 2 ♀♀ (AMNH), same locality, 3 October 2005 (H. Montaña, G. Montiel, I. Mondragón, cols.).

Etymology.—The specific name is a noun in apposition and refers to the state of the type locality: Chiapas, Mexico.

Diagnosis.—Males can be distinguished by the D-shaped embolus directed toward the distal part of the tibia, and the

conical shape of the distal cymbial apophysis, curved distally with one terminal claw (Figs. 13, 14). Females can be distinguished by the mouth-like form of the genital area (Fig. 18).

Description.—Male (holotype): Specimen preserved in alcohol with carapace dark blue with darker regions around the fovea, and on the lateral margins (Fig. 11). Clypeus long, same color as carapace. Chelicerae blue-green, with seven small teeth and one large tooth on a single line (Fig. 12). Fangs dark orange. Six eyes in three groups, slightly elevated, with black rings around them. Sternum dark blue, with a white central spot, wider than long. Labium square, as wide as long, dark blue, not fused to the sternum. Endites green, convergent, longer than wide. Coxae greenish, darker distally. Trochanters greenish. Femur I yellowish. Femora II–IV pale fuchsia, bluish distally. Patellae pale. Tibiae, metatarsi and tarsi yellowish. Opisthosoma oval, longer than wide and deep, dark blue (Fig. 11). Ventral plate of gonopore pale blue. ALS cylindrical. PMS slender and smaller than the others. PLS conical. All spinnerets same color as opisthosoma.

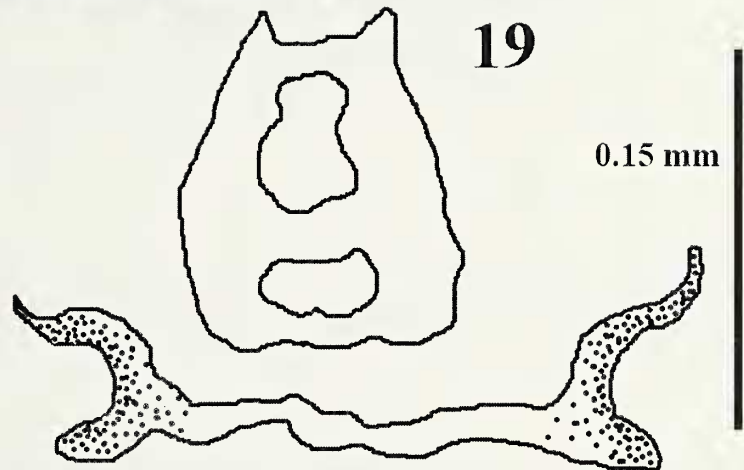
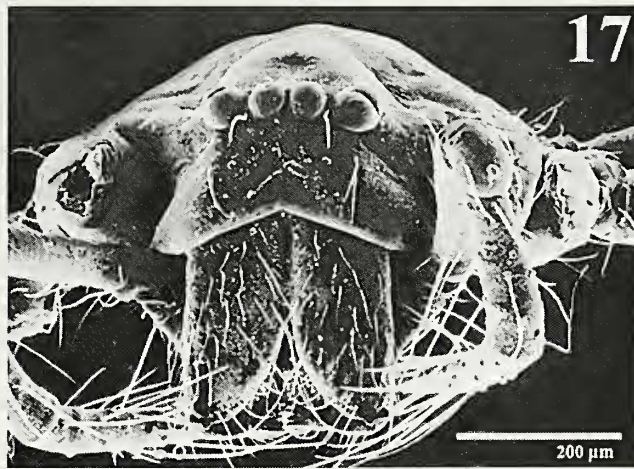


Figures 11–16.—*Ochyrocera chiapas* new species, male: 11. Prosoma and opisthosoma, dorsal view; 12. Right chelicera, anterior view; 13. Left palp, prolateral view; 14. Left palp, retrolateral view; 15. Embolus; 16. Embolus, apical view.

Palp: Tibia long and cylindrical, distal apophysis of cymbium conical, curved distally (Figs. 13, 14). Globular bulb; embolus long and curved with D-shape, in prolateral view directed towards distal part of the tibia (Fig. 13).

Embolus wider distally, with marked apical curvature with hook-shape (Figs. 15, 16).

Measurements: Total length 1.68. Carapace 0.78 long, 0.67 wide. Clypeus length 0.17. Diameter of AME 0.05, ALE 0.06,



Figures 17–19.—*Ochyrocera chiapas* new species, female: 17. Carapace, anterior view; 18. Genital area, ventral view; 14. Genital area, dorsal view.

PLE 0.04. Sternum 0.36 long, 0.48 wide. Leg lengths: I- femur 3.3/ patella 0.24/ tibia 3.7/ metatarsus 2.4/ tarsus 1.23/ total 10.87; II- 2.3/ 0.2/ 2.47/ 1.63/ 0.93/ 7.53; III- 1.75/ 0.2/ 1.74/ 1.23/ 0.77/ 5.69; IV- 2.3/ 0.23/ 2.52/ 1.58/ 1.03/ 7.66. Leg formula 1-4-2-3.

Female (Paratype): Differs from male as follows: fangs of chelicerae pale reddish, darker at base (Fig. 17). Endites dark blue, lighter basally. Coxae dark blue, lighter basally. Trochanters light blue with dark blue spots. Femora and tibiae purple, white distally. Patellae dark blue. Metatarsi and tarsi pale. Opisthosoma more voluminous than in male.

Genital area: Weakly sclerotized, light blue, mouth-shaped in ventral view (Fig. 18). Spermathecae slender and curved, separated by a visible duct (Fig. 19).

Measurements: Total length 1.76. Carapace 0.75 long, 0.65 wide. Clypeus length 0.18. Diameter of AME 0.04, ALE 0.06, PLE 0.04. Sternum 0.4 long, 0.44 wide. Leg lengths: I- femur 2.78/ patella 0.24/ tibia 3.1/ metatarsus 2.05/ tarsus 1.16/ total 9.33; II- 1.95/ 0.22/ 2.0/ 1.23/ 0.5/ 5.9; III- 1.54/ 0.2/ 1.6/ 1.16/ 0.75/ 5.25; IV- 2.06/ 0.21/ 2.15/ 1.46/ 0.93/ 6.81. Leg formula: 1-4-2-3.

Variation.—Total length: 1.6–1.75. Coloration: carapace varies from clear blue to greenish. Chelicerae ranges from blue-green to pale green. The white central spot of the sternum is small, circular in some specimens; in others longitudinal, wide or thin. Some specimens have legs fuchsia and others pale

fuchsia. Sternum and labium vary from dark blue to light blue. Endites and coxae greenish on males and on the females between dark and light blue.

Distribution.—Known only from the localities of the type material (Fig. 20).

Related species.—*Ochyrocera chiapas* resembles *O. arietina* Simon, 1891 from the island of St. Vincent, in the similar shape of the embolus and distal apophysis of cymbium, but in *O. chiapas* the embolus is more strongly curved and directed toward the distal part of the tibiae forming a “D;” in *O. arietina*, the embolus is not as strongly curved as in *O. chiapas*. In addition, in *O. arietina* the embolus is directed toward the distal apophysis of the cymbium and not toward the tibia like in *O. chiapas*. The distal apophysis of the cymbium of the palp in *O. chiapas* has a claw-shaped curve and an index-finger shape in *O. arietina*; finally the tibia of the palp in *O. chiapas* is longer and cylindrical, whereas in *O. arietina* it is shorter and oval.

Natural History.—The specimens of *O. chiapas* were collected at an elevation between 160–260 m in high humidity under rotten logs, hollow trunks, and abundant leaf litter. The habitat was in tropical rainforest, in the Lacandona region located in eastern Chiapas, near the border with Guatemala. Males and females were collected near each other, and the females carried their egg sacs with the chelicerae.



Figure 20.—Distribution records of *Ochyrocera* from Mexico: *O. juquila* new species (■), *O. chiapas* new species (▲), *O. simoni* O. Pickard-Cambridge 1894 (◆), and *O. fagei* Brignoli 1974 (●).

KEY TO SPECIES OF *OCHYROCERA* FROM MEXICO:

1. Distal apophysis on cymbium claw-shaped; bulb of the palp oval (Figs. 13, 14) 2
- Distal apophysis of cymbium other form; bulb of the palp globular (Figs. 3, 4) 3
2. Embolus slender and long, D-shaped, directed toward the distal part of the tibia (Figs. 13, 14) *O. chiapas* new species.
- Embolus stout and short, V-shaped, directed toward the centre of the cymbial apophysis *O. fagei* Brignoli 1974.
3. Embolus slender in distal part and stout in basal part, V-shaped, with a basal protuberance; cymbial apophysis with hooked tip (Figs. 3, 4) *O. juquila* new species.
- Embolus slender and long, J-shaped; distal cymbial apophysis wider in the centre; tibia of the palp wider at tip *O. simoni* O. Pickard-Cambridge 1894.

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